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DIRECT STATION SELECTION TELEPHONE SET EMPLOYING PROXIMITY TYPE SELECTOR SWITCHES

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ABSTRACT OF THE DISCLOSURE

A plurality of proximity switches are fabricated on a common plastic sheet or substrate. The switch sheets, which may be multipled in book, card or scroll form, are mounted on a direct station selection or repertory dialer type telephone set in a manner that ensures ready access to each individual proximity switch. The touch-operation of any switch initiates the establishment of a communication path between the set and a distant station corresponding to that switch.

BACKGROUND OF THE INVENTION

Field of the invention

This invention relates to direct station selection telephone sets and more particularly to the ulitization of proximity type selector switches with such sets.

Description of the prior art

In the field of telephony, a number of systems are known that permit a subscriber at one station to initiate the establishment of a communication path to any one of a selected group of distant stations simply by operating a single key, or a pair of keys, which may be common pushbutton operated switches for example. Such systems avoid the usual requirement for the successive manual operation of a dial mechanism normally employed to generate the particular 7 or 10 digit dial signal that corresponds to a selected directory number.

Telephones of the type indicated are not restricted to any particular circuit arrangement but instead involve a number of different circuit and system forms. The term "direct station selection," abbreviated DSS, is employed herein generically to designate any telephone system or set that provides for single key or limited key dialing. One DSS arrangement, for example, is the conventional repertory dialer which may be combined with a rotary dial telephone set as shown by J. H. Ham et al., in U.S. Patent 2,941,043, issued June 14, 1960, or with a Touch-Tone or multifrequency signaling dial telephone set as shown by R. A. Miller et al. in U.S. Patent 3,243,-517, issued Mar. 29, 1966. Repertory dialers employ built-in memory units, typically magnetic, that provide storage space for recording a selected group of directory telephone numbers. Access to a particular number is normally provided by rotating a drum or the like to expose written indicia of the party corresponding to that number. A single key is then depressed to initiate automatic dialing of the number selected.

A somewhat different form of DSS is disclosed by R. A. Plyer in U.S. Patent 3,115,551, issued Dec. 24, 1963, that shows a key telephone system employing a multibutton key set at each station. Each station may gain direct access to any other station in the system by the operation of a single key or pushbutton that corresponds to the station to be called. In this system, connecting functions and switching capabilities are removed

from the telephone set and are located instead in convention common equipment known as station concentrators or line connectors. A similar DSS system employing multifrequency or Touch-Tone signaling is shown by R. A. Plyer in U.S. Patent 3,301,967, issued Jan. 31, 1967.

Various additional DSS arrangements or modified DSS systems are also known in the prior art, including those that utilize central office storage or storage in memory apparatus situated at some convenient intermediate location between the central office and the participating stations. Such arrangements are also commonly identified as abbreviated dialing systems or shared memory repertory systems.

All of the DSS systems indicated above and all known related systems share a common limitation. The number of stations that may be called directly from a given station by the operation of a single switch is closely restricted by the physical spaced required for an array of station selection keys or pushbuttons. A dozen pushbuttons or even several dozen may reasonably be accommodated on the face of a telephone unit of somewhat expanded size as illustrated by the commercially available Call Director telephone set or by the multibutton key set in U.S. Patent 3,115,551, cited above. Beyond that point, however, the space required may exceed even the key space of a PBX unit, a requirement that would obviously be unacceptable to the average telephone subscriber.

The restriction on the number capacity of a DSS telephone set is imposed almost entirely by the practical limit on selector key space. Limits imposed on number capacity by the space requirements of memory or storage units and related interconnections are not significant, owing to the availability of low volume high capacity storage means such as ferrite sheet memory systems and the like and to the availability of integrated circuit techniques.

A broad object of the invention is to simplify DSS telephone sets.

A more specific object is to reduce the space required for a multi-key array in a telephone set.

SUMMARY OF THE INVENTION

The foregoing and related objects are achieved in accordance with the principles of the invention by the employment of uniquely arranged proximity switches in a direct station selection telephone set in lieu of the contional keys or pushbuttons normally utilized to initiate station selection. Various types of proximity switches may by employed. In accordance with a key feature of the invention, however, however, the capactive element or elements of each of the proximity switches is mounted on a common substrate, which may be a sheet of plastic for example. Alternatively, each group in a plurality of groups of proximity switches may be frabricated on a common respective substrate sheet. One element of each proximity switch comprises a touch-button and touch-operation of the button furnishes a capacitive path to ground.

Circuitry associated with the proximity switches includes a single common oscillator and, for each switch, a respective signal level detector. Depending upon the particular type of switch and upon the circuit arrangement employed, touch-operation of a selected switch effects an attenuation of the oscillator signal or applies the oscillator signal to the proper detector circuit. In either case the signal change is sensed by the detector circuit which in turn generates a suitable output to effect a switch closure that initiates a dialing or switching cycle.

An important aspect of the invention deals with the